In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
path = 'Downloads/individual_stocks_5yr'
company_list = ['AAPL_data.csv','GOOG_data.csv','MSFT_data.csv','AMZN_data.csv']
all_data = pd.DataFrame()
for file in company_list:
    current_df = pd.read_csv(path+'/'+file)
    all_data = pd.concat([all_data,current_df])
all_data.shape
```

Out[2]:
```
(4752, 7)
```

In [3]:
```
all_data.head()
```

Out[3]:

| | date | open | high | low | close | volume | Name |
|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL |
| **1** | 2013-02-11 | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL |
| **2** | 2013-02-12 | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL |
| **3** | 2013-02-13 | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL |
| **4** | 2013-02-14 | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL |

In [4]:
```
# Analysing closing price of all the stocks
```

In [5]:
```
all_data.dtypes
```

Out[5]:
```
date       object
open      float64
high      float64
low       float64
close     float64
volume      int64
Name       object
dtype: object
```

In [6]:
```
all_data['date'] = pd.to_datetime(all_data['date'])
```

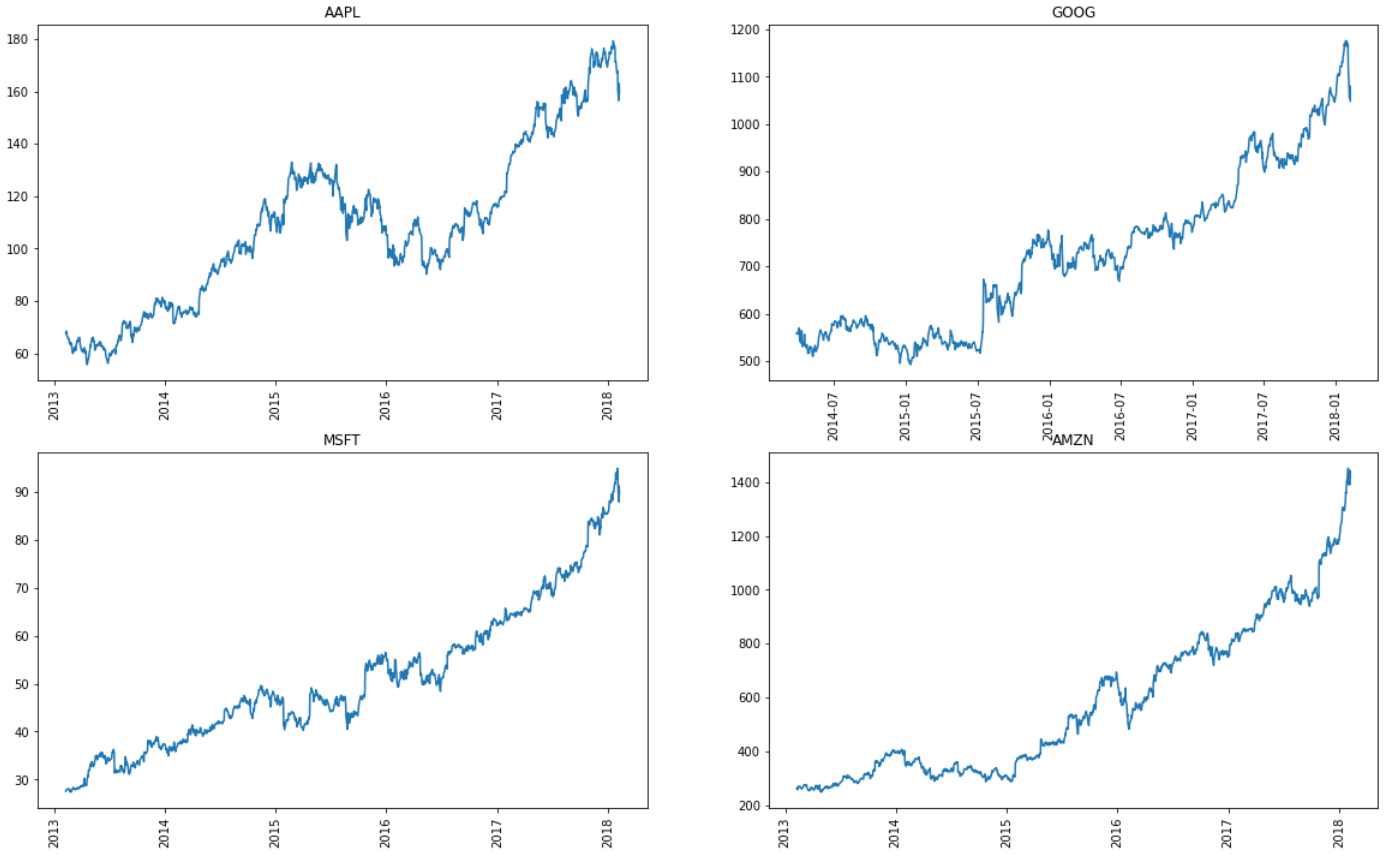
In [7]:
```
all_data.dtypes
```

Out[7]:
```
date      datetime64[ns]
open             float64
high             float64
low              float64
close            float64
volume             int64
Name              object
dtype: object
```

In [8]:
```
tech_list = all_data['Name'].unique()
```

In [9]:
```
plt.figure(figsize = (20,12))
for i, company in enumerate(tech_list,1):
    plt.subplot(2,2,i)
    df = all_data[all_data['Name']==company]
    plt.plot(df['date'],df['close'])
```

```
    plt.xticks(rotation='vertical')
    plt.title(company)
```



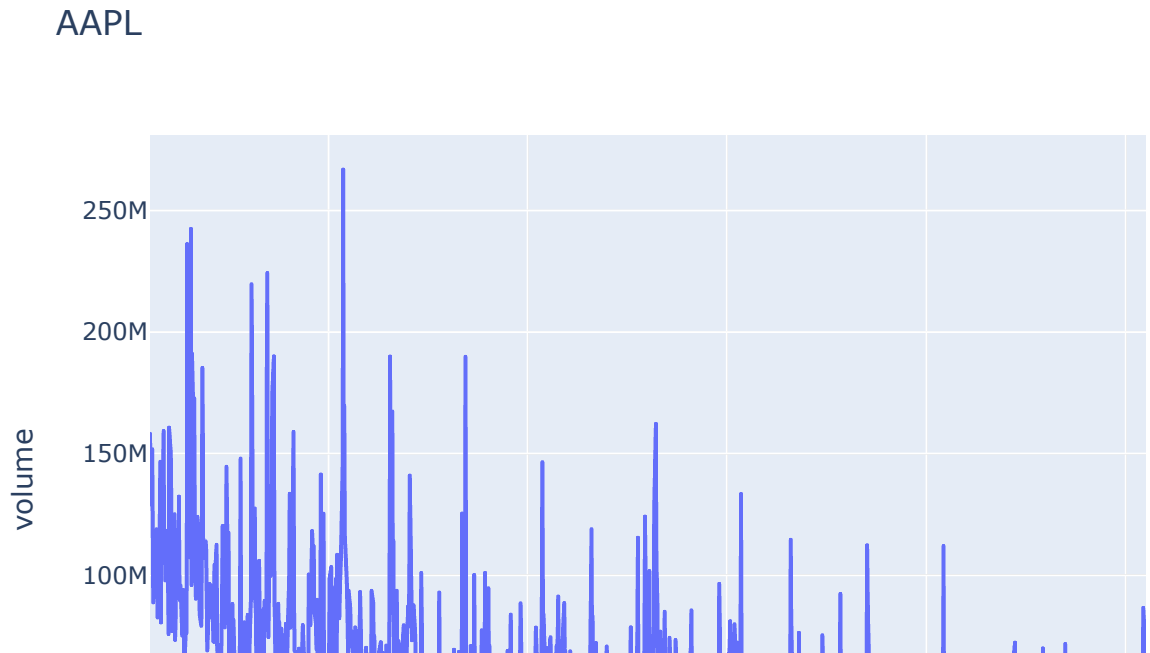

In [10]:
```
# Total volume of stock being traded each day
```

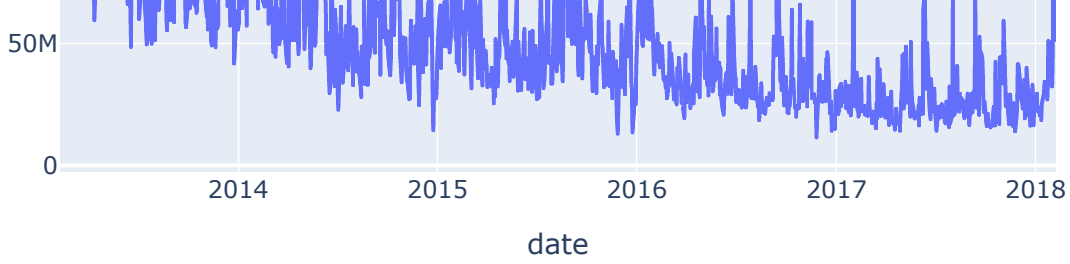
In [ ]:
```

```

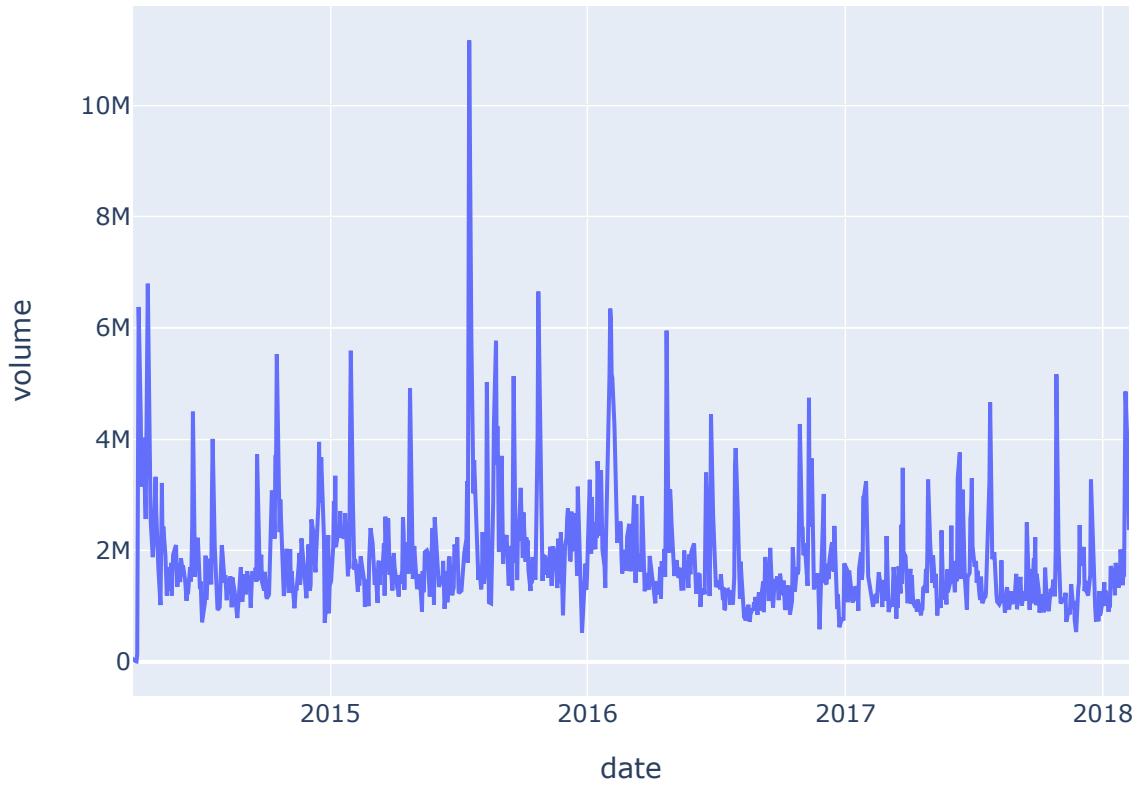
In [11]:
```
import plotly.express as px
```

In [12]:
```
for company in tech_list:
    df = all_data[all_data['Name']==company]
    fig = px.line(df,x= 'date',y = 'volume', title = company)
    fig.show()
```

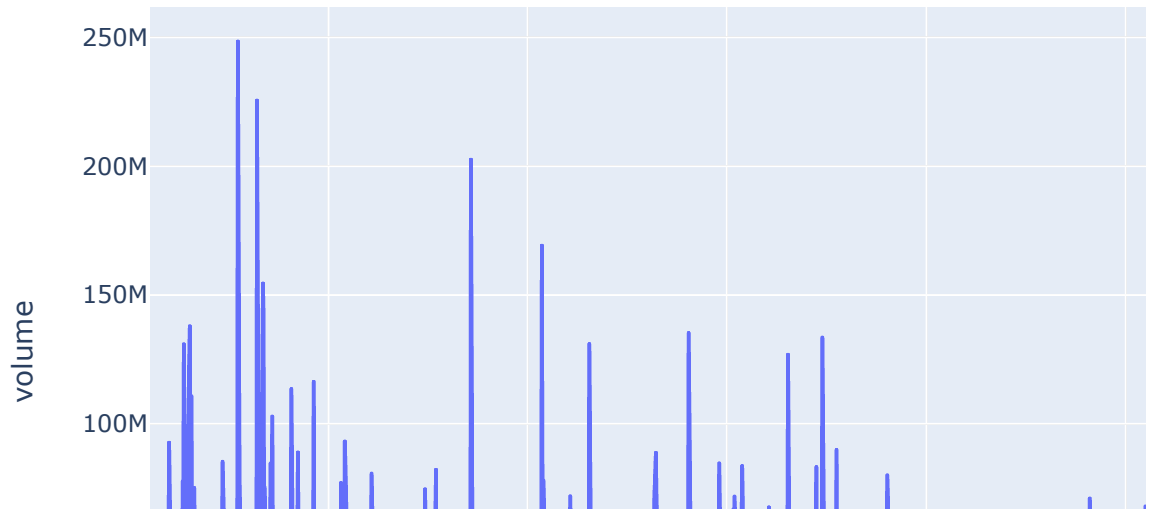


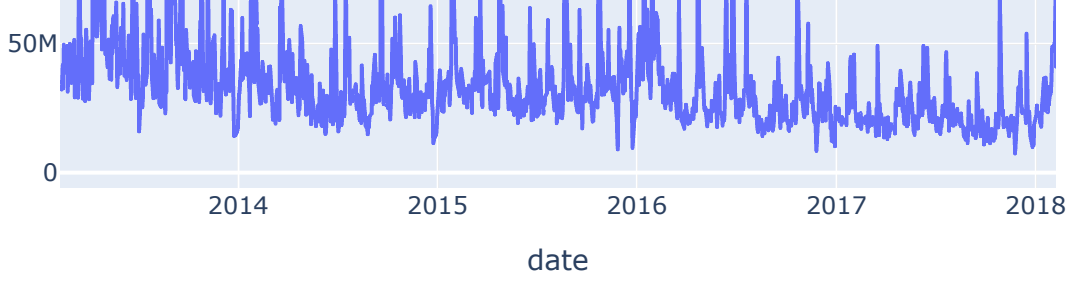

50M
0
2014
2015
2016
2017
2018
date

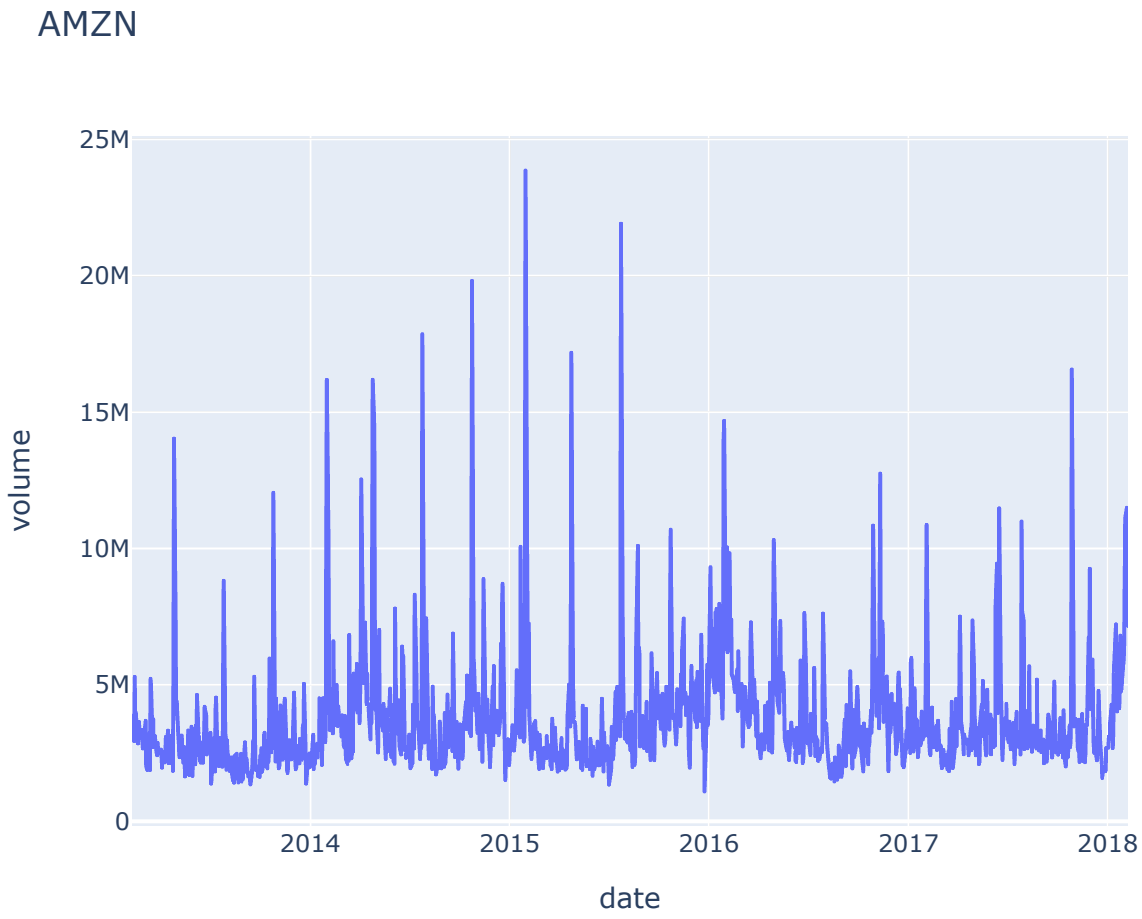
GOOG


10M
8M
6M
4M
2M
0
volume
2015
2016
2017
2018
date

MSFT


250M
200M
150M
100M
volume




In [13]:
```
# Daily price change in stock
```

In [14]:
```
df = pd.read_csv('C:\individual_stocks_5yr/AAPL_data.csv')
df.head()
```

Out[14]:

| | date | open | high | low | close | volume | Name |
|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL |
| **1** | 2013-02-11 | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL |
| **2** | 2013-02-12 | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL |
| **3** | 2013-02-13 | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL |
| **4** | 2013-02-14 | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL |

In [15]:
```
df['Daily_price_change'] = df['close']-df['open']
```

In [16]:
```
df.head()
```

Out[16]:

| | date | open | high | low | close | volume | Name | Daily_price_change |
|---|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL | 0.1400 |
| **1** | 2013-02-11 | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL | 0.4900 |
| **2** | 2013-02-12 | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL | -1.6586 |
| **3** | 2013-02-13 | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL | -0.0286 |
| **4** | 2013-02-14 | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL | 0.2957 |

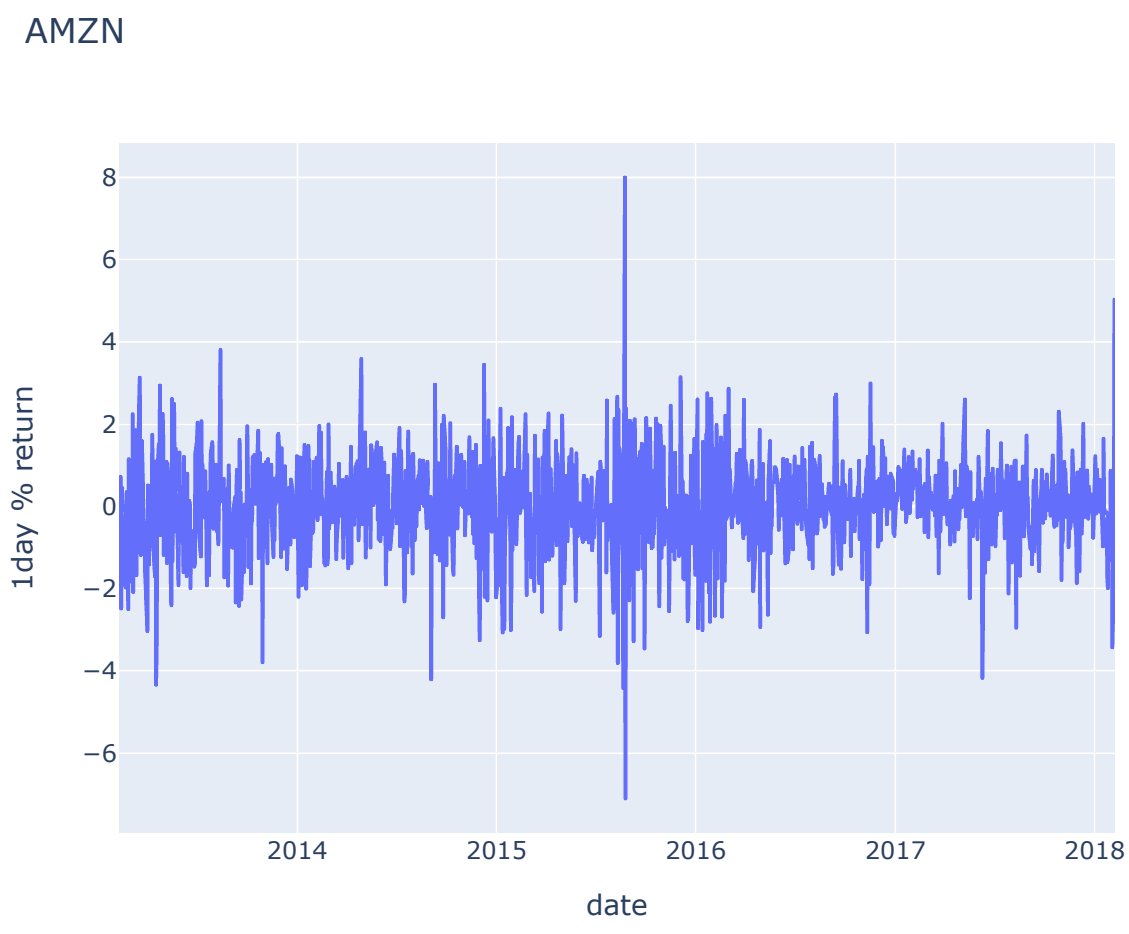
In [17]:
```
df['1day % return'] = ((df['close']-df['open'])/df['close'])*100
```

In [18]:
```
df.head()
```

Out[18]:

| | date | open | high | low | close | volume | Name | Daily_price_change | 1day % return |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL | 0.1400 | 0.206325 |
| **1** | 2013-02-11 | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL | 0.4900 | 0.714688 |
| **2** | 2013-02-12 | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL | -1.6586 | -2.481344 |
| **3** | 2013-02-13 | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL | -0.0286 | -0.042869 |
| **4** | 2013-02-14 | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL | 0.2957 | 0.443624 |

In [19]:
```
fig = px.line(df,x= 'date',y = '1day % return', title = company)
fig.show()
```



In [20]:
```
# Analyze monthly mean of close feature
```

In [21]:
```
df2 = df.copy()
```

In [22]:
```
df2.dtypes
```

Out[22]:
```
date                   object
open                  float64
high                  float64
low                   float64
close                 float64
volume                  int64
Name                   object
Daily_price_change    float64
1day % return         float64
dtype: object
```

In [23]:
```
df2['date']=pd.to_datetime(df2['date'])
```

In [24]:
```
df2.head()
```

Out[24]:

| | date | open | high | low | close | volume | Name | Daily_price_change | 1day % return |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL | 0.1400 | 0.206325 |
| **1** | 2013-02-11 | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL | 0.4900 | 0.714688 |
| **2** | 2013-02-12 | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL | -1.6586 | -2.481344 |
| **3** | 2013-02-13 | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL | -0.0286 | -0.042869 |
| **4** | 2013-02-14 | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL | 0.2957 | 0.443624 |

In [25]:
```
df2.set_index('date',inplace = True)
```

In [26]:
```
df2.head()
```

Out[26]:

| date | open | high | low | close | volume | Name | Daily_price_change | 1day % return |
|---|---|---|---|---|---|---|---|---|
| **2013-02-08** | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL | 0.1400 | 0.206325 |
| **2013-02-11** | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL | 0.4900 | 0.714688 |
| **2013-02-12** | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL | -1.6586 | -2.481344 |
| **2013-02-13** | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL | -0.0286 | -0.042869 |
| **2013-02-14** | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL | 0.2957 | 0.443624 |

In [27]:
```
df2['2013-02-08':'2013-02-14']
```

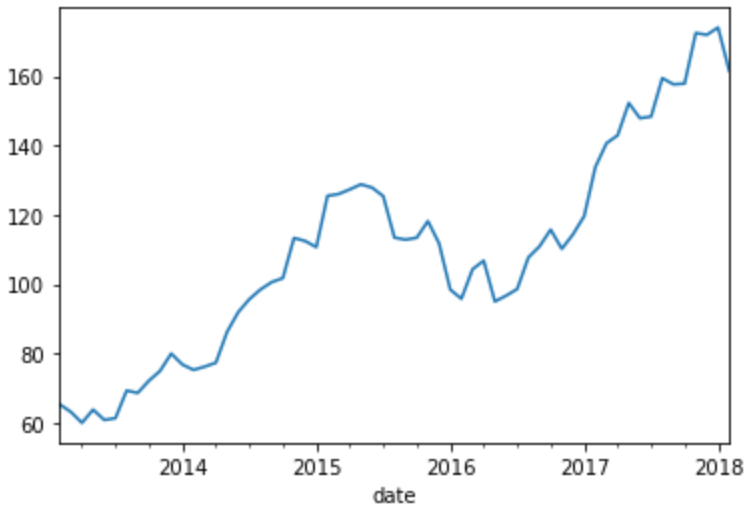
Out[27]:

| date | open | high | low | close | volume | Name | Daily_price_change | 1day % return |
|---|---|---|---|---|---|---|---|---|
| **2013-02-08** | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL | 0.1400 | 0.206325 |
| **2013-02-11** | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL | 0.4900 | 0.714688 |
| **2013-02-12** | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL | -1.6586 | -2.481344 |
| **2013-02-13** | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL | -0.0286 | -0.042869 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **2013-02-14** | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL | 0.2957 | 0.443624 |

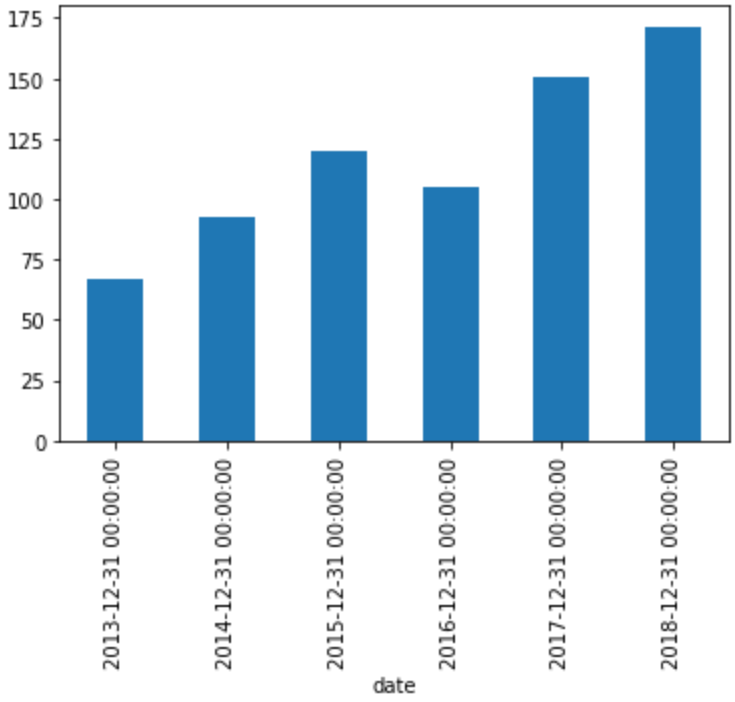
In [28]:
```
df2['close'].resample('M').mean().plot()
```

Out[28]:
```
<AxesSubplot:xlabel='date'>
```




In [29]:
```
df2['close'].resample('Y').mean().plot(kind = 'bar')
```

Out[29]:
```
<AxesSubplot:xlabel='date'>
```




In [30]:
```
# Analyse whether stock prices of these tech compnies are correlated or not
```

In [31]:
```
appl = pd.read_csv('C:\individual_stocks_5yr/AAPL_data.csv')
```

In [32]:
```
appl.head()
```

Out[32]:

| | date | open | high | low | close | volume | Name |
|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL |
| **1** | 2013-02-11 | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2** | 2013-02-12 | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL |
| **3** | 2013-02-13 | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL |
| **4** | 2013-02-14 | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL |

In [33]:
```
amzn = pd.read_csv('C:\individual_stocks_5yr/AMZN_data.csv')
```

In [34]:
```
amzn.head()
```

Out[34]:

| | date | open | high | low | close | volume | Name |
|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 261.40 | 265.25 | 260.555 | 261.95 | 3879078 | AMZN |
| **1** | 2013-02-11 | 263.20 | 263.25 | 256.600 | 257.21 | 3403403 | AMZN |
| **2** | 2013-02-12 | 259.19 | 260.16 | 257.000 | 258.70 | 2938660 | AMZN |
| **3** | 2013-02-13 | 261.53 | 269.96 | 260.300 | 269.47 | 5292996 | AMZN |
| **4** | 2013-02-14 | 267.37 | 270.65 | 265.400 | 269.24 | 3462780 | AMZN |

In [35]:
```
msft = pd.read_csv('C:\individual_stocks_5yr/MSFT_data.csv')
```

In [36]:
```
msft.head()
```

Out[36]:

| | date | open | high | low | close | volume | Name |
|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 27.35 | 27.71 | 27.31 | 27.55 | 33318306 | MSFT |
| **1** | 2013-02-11 | 27.65 | 27.92 | 27.50 | 27.86 | 32247549 | MSFT |
| **2** | 2013-02-12 | 27.88 | 28.00 | 27.75 | 27.88 | 35990829 | MSFT |
| **3** | 2013-02-13 | 27.93 | 28.11 | 27.88 | 28.03 | 41715530 | MSFT |
| **4** | 2013-02-14 | 27.92 | 28.06 | 27.87 | 28.04 | 32663174 | MSFT |

In [37]:
```
goog = pd.read_csv('C:\individual_stocks_5yr/GOOG_data.csv')
```

In [38]:
```
goog.head()
```

Out[38]:

| | date | open | high | low | close | volume | Name |
|---|---|---|---|---|---|---|---|
| **0** | 2014-03-27 | 568.000 | 568.00 | 552.92 | 558.46 | 13052 | GOOG |
| **1** | 2014-03-28 | 561.200 | 566.43 | 558.67 | 559.99 | 41003 | GOOG |
| **2** | 2014-03-31 | 566.890 | 567.00 | 556.93 | 556.97 | 10772 | GOOG |
| **3** | 2014-04-01 | 558.710 | 568.45 | 558.71 | 567.16 | 7932 | GOOG |
| **4** | 2014-04-02 | 565.106 | 604.83 | 562.19 | 567.00 | 146697 | GOOG |

In [39]:
```
close = pd.DataFrame()
```

In [40]:
```
close['appl'] = appl['close']
close['goog'] = goog['close']
close['amzn'] = amzn['close']
close['msft'] = msft['close']
```

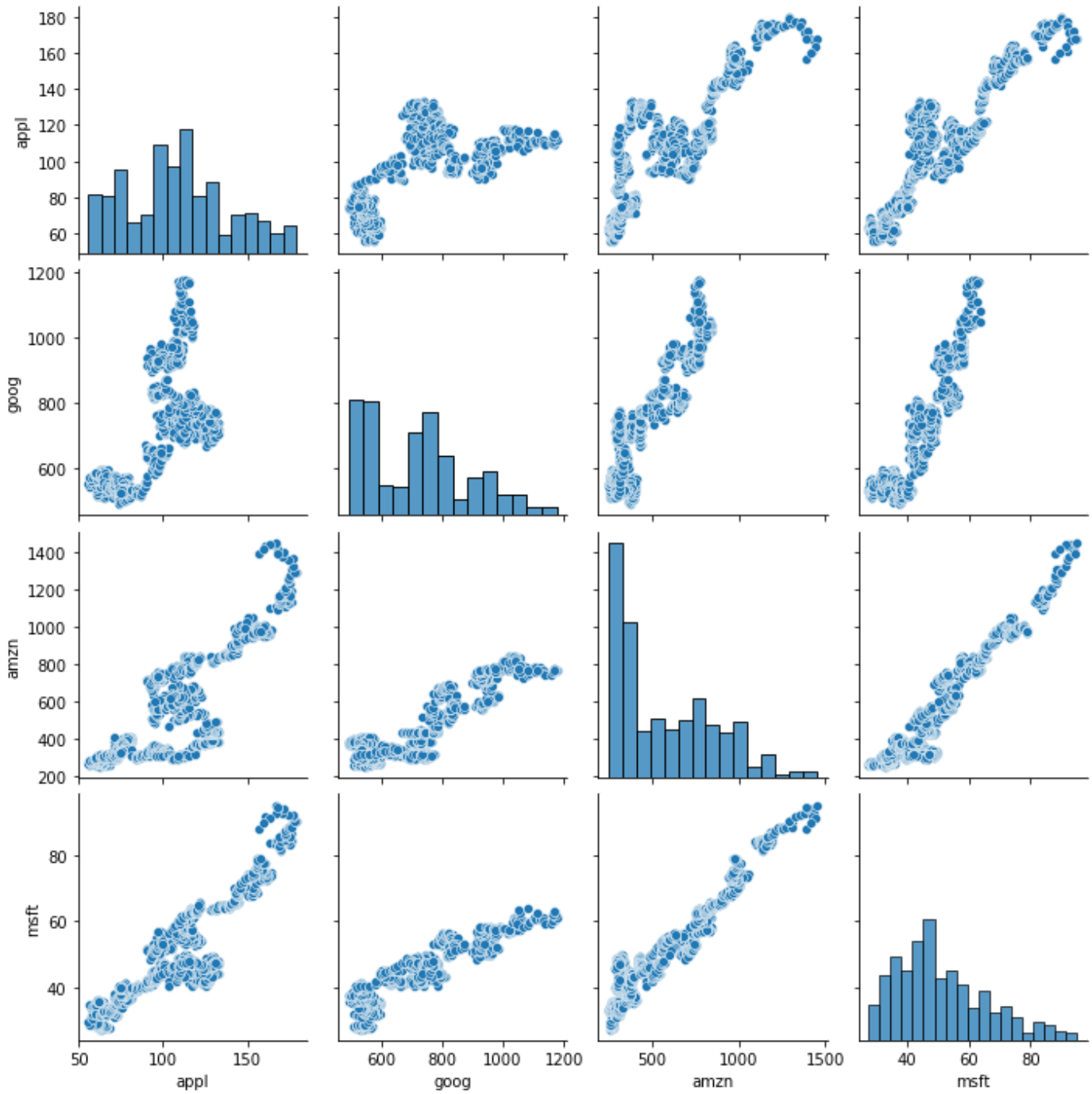
In [41]:
```
close.head()
```

Out[41]:

| | appl | goog | amzn | msft |
|---|---|---|---|---|
| **0** | 67.8542 | 558.46 | 261.95 | 27.55 |
| **1** | 68.5614 | 559.99 | 257.21 | 27.86 |
| **2** | 66.8428 | 556.97 | 258.70 | 27.88 |
| **3** | 66.7156 | 567.16 | 269.47 | 28.03 |
| **4** | 66.6556 | 567.00 | 269.24 | 28.04 |

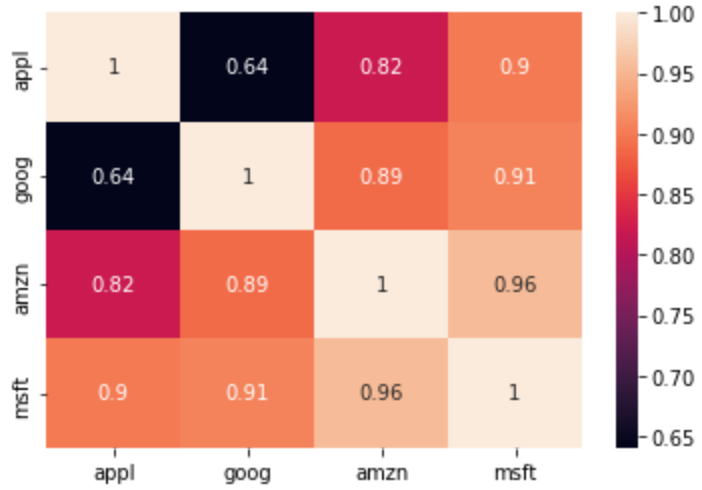
In [42]:
```
sns.pairplot(data=close)
```

Out[42]:
```
<seaborn.axisgrid.PairGrid at 0x211c145b2b0>
```




In [43]:
```
sns.heatmap(close.corr(),annot=True)
```

Out[43]:
```
<AxesSubplot:>
```




In [44]:
```
# Analyse Daily return of each stock & how they are co-related
```

In [45]:
```
appl.head()
```

Out[45]:

| | date | open | high | low | close | volume | Name |
|---|---|---|---|---|---|---|---|
| **0** | 2013-02-08 | 67.7142 | 68.4014 | 66.8928 | 67.8542 | 158168416 | AAPL |
| **1** | 2013-02-11 | 68.0714 | 69.2771 | 67.6071 | 68.5614 | 129029425 | AAPL |
| **2** | 2013-02-12 | 68.5014 | 68.9114 | 66.8205 | 66.8428 | 151829363 | AAPL |
| **3** | 2013-02-13 | 66.7442 | 67.6628 | 66.1742 | 66.7156 | 118721995 | AAPL |
| **4** | 2013-02-14 | 66.3599 | 67.3771 | 66.2885 | 66.6556 | 88809154 | AAPL |

In [46]:
```
data = pd.DataFrame()
```

In [48]:
```
data['aapl_change'] = ((appl['close']-appl['open'])/appl['close'])*100
data['goog_change'] = ((goog['close']-goog['open'])/goog['close'])*100
data['amzn_change'] = ((amzn['close']-amzn['open'])/amzn['close'])*100
data['msft_change'] = ((msft['close']-msft['open'])/msft['close'])*100
```

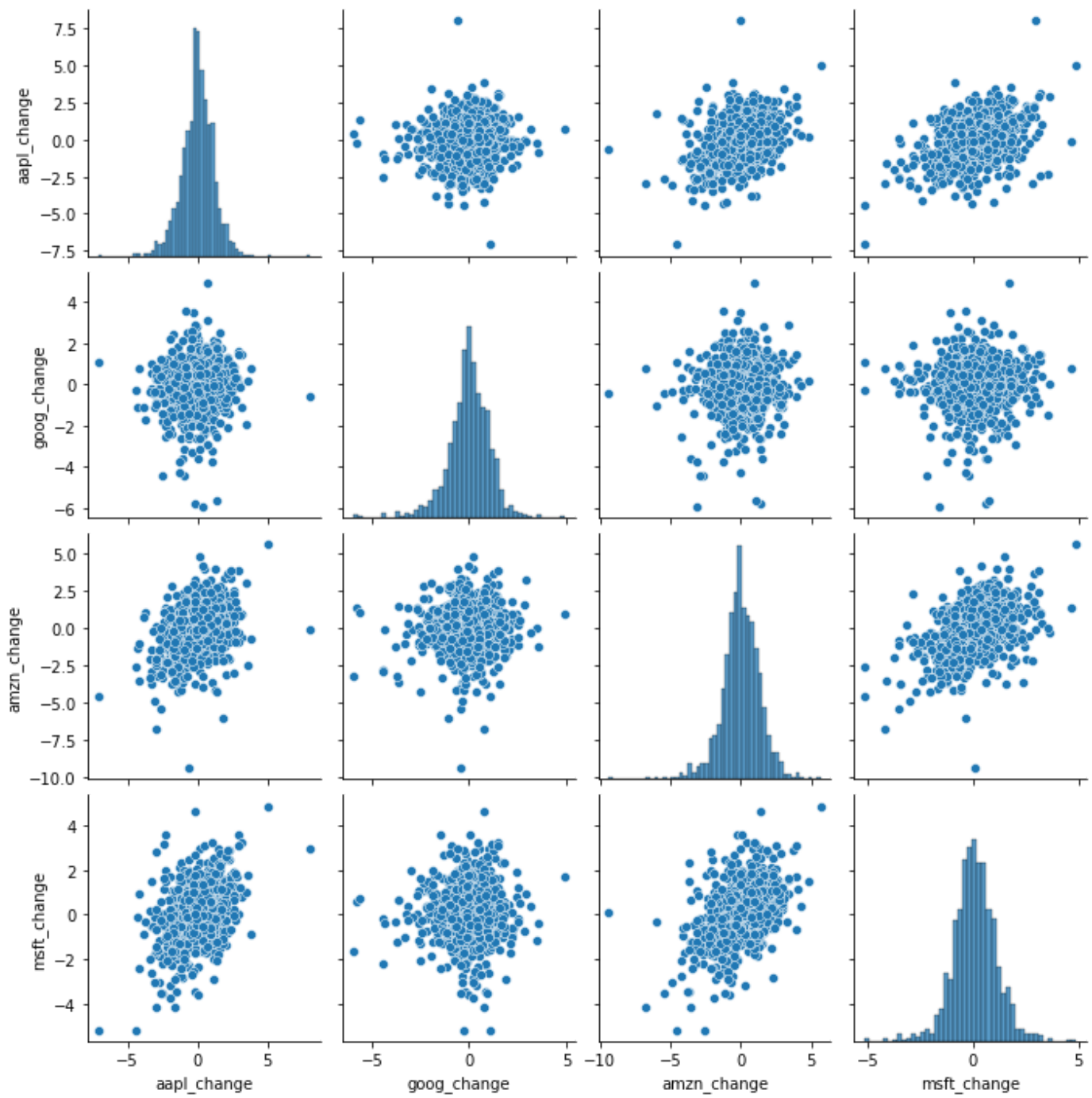
In [49]:
```
data.head()
```

Out[49]:

| | aapl_change | goog_change | amzn_change | msft_change |
|---|---|---|---|---|
| **0** | 0.206325 | -1.708269 | 0.209964 | 0.725953 |
| **1** | 0.714688 | -0.216075 | -2.328836 | 0.753769 |
| **2** | -2.481344 | -1.781065 | -0.189409 | 0.000000 |
| **3** | -0.042869 | 1.489879 | 2.946525 | 0.356761 |
| **4** | 0.443624 | 0.334039 | 0.694548 | 0.427960 |

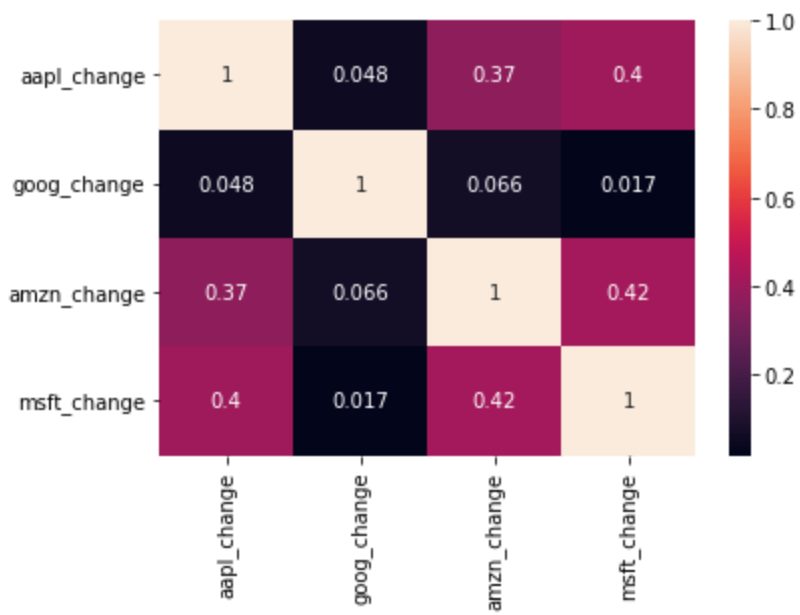
In [50]:
```
sns.pairplot(data=data)
```

Out[50]:
```
<seaborn.axisgrid.PairGrid at 0x211c03f8a60>
```




In [51]:
```
sns.heatmap(data.corr(),annot=True)
```

Out[51]:
```
<AxesSubplot:>
```



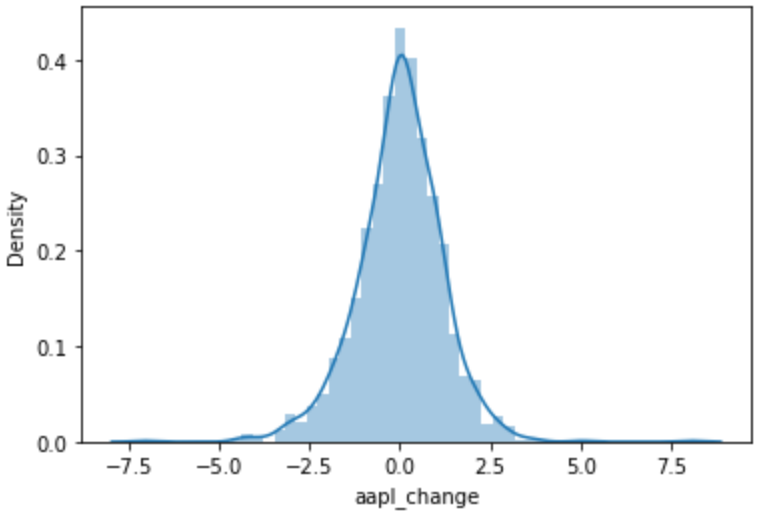

In [52]:
```
# Value at risk analysis for tech companies
```

In [55]:
```
sns.distplot(data['aapl_change'])
```

```
C:\Users\NITESH\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarnin
g:

`distplot` is a deprecated function and will be removed in a future version. Please adap
t your code to use either `displot` (a figure-level function with similar flexibility) o
r `histplot` (an axes-level function for histograms).
```

Out[55]:
```
<AxesSubplot:xlabel='aapl_change', ylabel='Density'>
```




In [61]:
```
data['aapl_change'].std()
### 68% of entire data
```

Out[61]:
```
1.1871377131421237
```

In [62]:
```
data['aapl_change'].std()*2
##### 95% of entire data
```

Out[62]:
```
2.3742754262842474
```

In [63]:
```
data['aapl_change'].std()*3
## 99.7%  of entire data
```

Out[63]: 3.561413139426371

In [65]:
```
data['aapl_change'].quantile(0.1)
```

Out[65]: -1.4246644227944307

In [67]:
```
data.describe().T
```

Out[67]:

| | count | mean | std | min | 25% | 50% | 75% | max |
|---|---|---|---|---|---|---|---|---|
| **aapl_change** | 1259.0 | -0.000215 | 1.187138 | -7.104299 | -0.658021 | 0.042230 | 0.715427 | 8.000388 |
| **goog_change** | 975.0 | -0.012495 | 1.092560 | -5.952266 | -0.551963 | 0.024951 | 0.672649 | 4.943550 |
| **amzn_change** | 1259.0 | -0.000398 | 1.358679 | -9.363077 | -0.738341 | -0.002623 | 0.852568 | 5.640265 |
| **msft_change** | 1259.0 | 0.076404 | 1.059260 | -5.177618 | -0.509241 | 0.061069 | 0.703264 | 4.861491 |

In [ ]:
```

```